SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Hydrogen peroxide solution
Product Number : 95321
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES
Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Serious eye damage (Category 1), H318
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal Word : Danger
Hazard statement(s)
H318 : Causes serious eye damage.
H401 : Toxic to aquatic life.
H412 : Harmful to aquatic life with long lasting effects.
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.2 Mixtures

**Formula**: H\(_2\)O\(_2\)  
**Molecular weight**: 34.01 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Peroxide</td>
<td>Ox. Liq. 1; Acute Tox. 4; Skin Corr. 1A; Eye Dam. 1; STOT SE 3; Aquatic Acute 2; Aquatic Chronic 3; H271, H302, H332, H314, H318, H335, H401, H412</td>
<td>&gt;= 70 %: Ox. Liq. 1, H271; 50 - &lt; 70 %: Ox. Liq. 2, H272; &gt;= 70 %: Skin Corr. 1A, H314; 50 - &lt; 70 %: Skin Corr. 1B, H314; 35 - &lt; 50 %: Skin Irrit. 2, H315; 8 - &lt; 50 %: Eye Dam. 1, H318; 5 - &lt; 8 %: Eye Irrit. 2, H319; &gt;= 35 %: STOT SE 3, H335; &gt; 40 - &lt; 50 %: Ox. Liq. 3, H272;</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>7722-84-1</td>
<td>&gt;= 30 - &lt; 35 %</td>
</tr>
<tr>
<td>EC-No.</td>
<td>231-765-0</td>
<td></td>
</tr>
<tr>
<td>Index-No.</td>
<td>008-003-00-9</td>
<td></td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

**General advice**
Show this material safety data sheet to the doctor in attendance.

**If inhaled**
After inhalation: fresh air.
**In case of skin contact**
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower.

**In case of eye contact**
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

**If swallowed**
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

**4.2 Most important symptoms and effects, both acute and delayed**
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

**4.3 Indication of any immediate medical attention and special treatment needed**
No data available

---

**SECTION 5: Firefighting measures**

**5.1 Extinguishing media**

**Suitable extinguishing media**
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media**
For this substance/mixture no limitations of extinguishing agents are given.

**5.2 Special hazards arising from the substance or mixture**
Nature of decomposition products not known.
Not combustible.
Ambient fire may liberate hazardous vapours.

**5.3 Advice for firefighters**
In the event of fire, wear self-contained breathing apparatus.

**5.4 Further information**
Prevent fire extinguishing water from contaminating surface water or the ground water system.

---

**SECTION 6: Accidental release measures**

**6.1 Personal precautions, protective equipment and emergency procedures**
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

**6.2 Environmental precautions**
Do not let product enter drains.

**6.3 Methods and materials for containment and cleaning up**
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.
6.4 **Reference to other sections**
For disposal see section 13.

**SECTION 7: Handling and storage**

7.1 **Precautions for safe handling**
For precautions see section 2.2.

7.2 **Conditions for safe storage, including any incompatibilities**

**Storage conditions**
Tightly closed. Do not store near combustible materials.

**Storage stability**
Recommended storage temperature
2 - 8 °C

**Storage class**
Storage class (TRGS 510): 5.1B: Oxidizing hazardous materials

7.3 **Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

**SECTION 8: Exposure controls/personal protection**

8.1 **Control parameters**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Peroxide</td>
<td>7722-84-1</td>
<td>TWA</td>
<td>1 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RemarksConfirmed animal carcinogen with unknown relevance to humans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1 ppm 1.4 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1 ppm 1.4 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEL</td>
<td>1 ppm 1.4 mg/m³</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1 ppm 1.4 mg/m³</td>
<td>USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)</td>
</tr>
</tbody>
</table>

8.2 **Exposure controls**

**Appropriate engineering controls**
Change contaminated clothing. Wash hands after working with substance.
Personal protective equipment

**Eye/face protection**
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

**Skin protection**
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

**Body Protection**
protective clothing

**Respiratory protection**
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains.

---

**SECTION 9: Physical and chemical properties**

9.1 **Information on basic physical and chemical properties**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| a) Appearance | Form: liquid, clear  
Color: colorless |
| b) Odor | No data available |
| c) Odor Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | No data available |
| f) Initial boiling point and boiling range | No data available |
| g) Flash point |  ()Not applicable |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
k) Vapor pressure  No data available
l) Vapor density  No data available
m) Density  1.11 g/cm³ at 20 °C (68 °F)
   Relative density  No data available
n) Water solubility  soluble
o) Partition coefficient: n-octanol/water  No data available
p) Autoignition temperature  Not applicable
q) Decomposition temperature  No data available
r) Viscosity  No data available
s) Explosive properties  Not classified as explosive.
t) Oxidizing properties  The substance or mixture is not classified as oxidizing.

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Violent reactions possible with:
The generally known reaction partners of water.

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Zinc, Powdered metals, Iron, Copper, Nickel, Brass, Iron and iron salts.

10.6 Hazardous decomposition products
In the event of fire: see section 5
SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

**Acute toxicity**
Acute toxicity estimate Oral - 2,312 mg/kg (Calculation method)
Acute toxicity estimate Inhalation - 4 h - 37 mg/l - vapor (Calculation method)

Symptoms: Possible symptoms: mucosal irritations
Acute toxicity estimate Dermal - > 5,000 mg/kg (Calculation method)
No data available

**Skin corrosion/irritation**
No data available

**Serious eye damage/eye irritation**
No data available
Mixture causes serious eye damage.

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
No data available

**Carcinogenicity**
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**
No data available
No data available

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Liver - Irregularities - Based on Human Evidence
Components

Hydrogen Peroxide

**Acute toxicity**
LD50 Oral - Rat - female - 693.7 mg/kg
(OECD Test Guideline 401)
Acute toxicity estimate Inhalation - 4 h - 11.1 mg/l - vapor
(Expert judgment)
LD50 Dermal - Rabbit - male and female - > 2,000 mg/kg
(US-EPA)
No data available

**Skin corrosion/irritation**
Causes severe burns. Classified according to Regulation (EU) 1272/2008, Annex VI
(Table 3.1/3.2)

**Serious eye damage/eye irritation**
Causes serious eye damage.

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
Method: OECD Test Guideline 474
Species: Mouse - male and female - Bone marrow
Result: negative

**Carcinogenicity**
No data available

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
Inhalation - May cause respiratory irritation. - Respiratory Tract

**Specific target organ toxicity - repeated exposure**

**Aspiration hazard**
No data available

---

**SECTION 12: Ecological information**

**12.1 Toxicity**

**Mixture**
No data available

**12.2 Persistence and degradability**
No data available

**12.3 Bioaccumulative potential**
No data available

**12.4 Mobility in soil**
No data available
12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

Components
Hydrogen Peroxide

Toxicity to fish
semi-static test LC50 - Pimephales promelas (fathead minnow) - 16.4 mg/l - 96 h
(US-EPA)

Toxicity to daphnia and other aquatic invertebrates
semi-static test LC50 - Daphnia pulex (Water flea) - 2.4 mg/l - 48 h
(US-EPA)

Toxicity to algae
static test ErC50 - Skeletonema costatum (marine diatom) - 1.38 mg/l - 72 h
Remarks: (ECHA)

static test NOEC - Skeletonema costatum (marine diatom) - 0.63 mg/l - 72 h
Remarks: (ECHA)

Toxicity to bacteria
static test EC50 - activated sludge - 466 mg/l - 30 min
(OECD Test Guideline 209)

static test EC50 - activated sludge - > 1,000 mg/l - 3 h
(OECD Test Guideline 209)

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 2014  Class: 5.1 (8)  Packing group: II
Proper shipping name: Hydrogen peroxide, aqueous solutions
Reportable Quantity (RQ): Poison Inhalation Hazard: No

IMDG
UN number: 2014  Class: 5.1 (8)  Packing group: II  EMS-No: F-H, S-Q
Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

**IATA**
UN number: 2014  Class: 5.1 (8)  Packing group: II
Proper shipping name: Hydrogen peroxide, aqueous solution

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**SECTION 15: Regulatory information**

**SARA 302 Components**
Hydrogen Peroxide  CAS-No.  7722-84-1  Revision Date  2014-05-05

**SARA 313 Components**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

---

**SECTION 16: Other information**

**Further information**
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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